



ROADRUNNER 98



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AFRL/HEA, 3 - 5 Nov



Overview

- **Distributed Mission Training (DMT) exercise focused on training warfighters to perform composite force missions that are rarely practiced due to cost, safety, and security constraints.**
- **Sponsored by USAF/XOC in cooperation with ACC/DOT**
- **Participants:**
 - AFRL/HEA - AWACS - 33FW
 - TACCSF - NAWC-TSD - Iowa ANG
 - AFIWC - 27FW - 355 Wing
 - Silicon Graphics Computer Systems
 - MultiGen, Inc

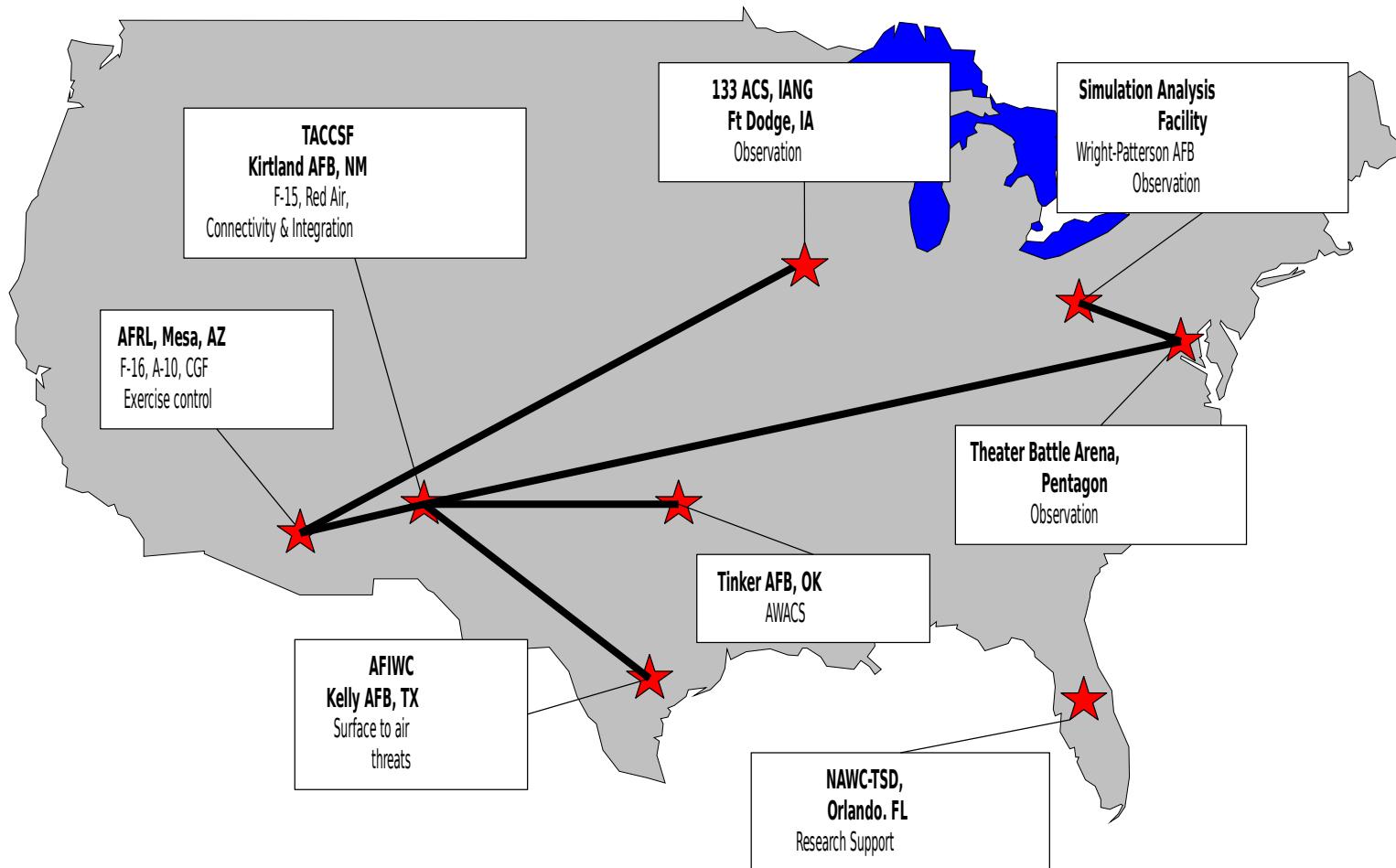


Objectives

- **Conduct a series of composite force missions using virtual and constructive simulations linked over a wide-area net in order to:**
 - **Document DMT technical capabilities necessary for combat mission training**
 - **Validate research approach for DMT training effectiveness studies**



Roadrunner 98 DMT Sites





Roadrunner Entities

- **Virtual simulations**
 - **4 F-16s, AFRL Mesa**
 - **4 F-15s, TACCSF Kirtland AFB**
 - **1 A-10, AFRL, Mesa**
 - **AWACS,**
 - » **2 Weapons Directors plus**
 - » **2 Air Surveillance Technicians**
- **Constructive Simulations**
 - **F-16 Block 50**
 - **F-16 Block 30**
 - **KC-135, E-3**
 - **SA-2, SA-6, SA-8, AAA**
 - **Early warning radars**
 - **MiG-29, Su-27**
 - **M-1, T-72**



Schedule

| Mon 13 Jul | Tue 14 Jul | Wed 15 Jul | Thu 16 Jul | Fri 17 Jul |
|--|--|--------------------------------------|--|---|
| Travel, Inbrief, Question- naires | Test 1: Surface Attack Tactics | Interdic- tion | Supres- sion of Enemy Air Defense: Conven- tional | Test 2: Surface Attack Tactics; Outbrief, Question- naires |
| Familiari- zation ride | Offensive Counter Air: Air to- Ground | Defensive Counter Air | Close Air Support | |

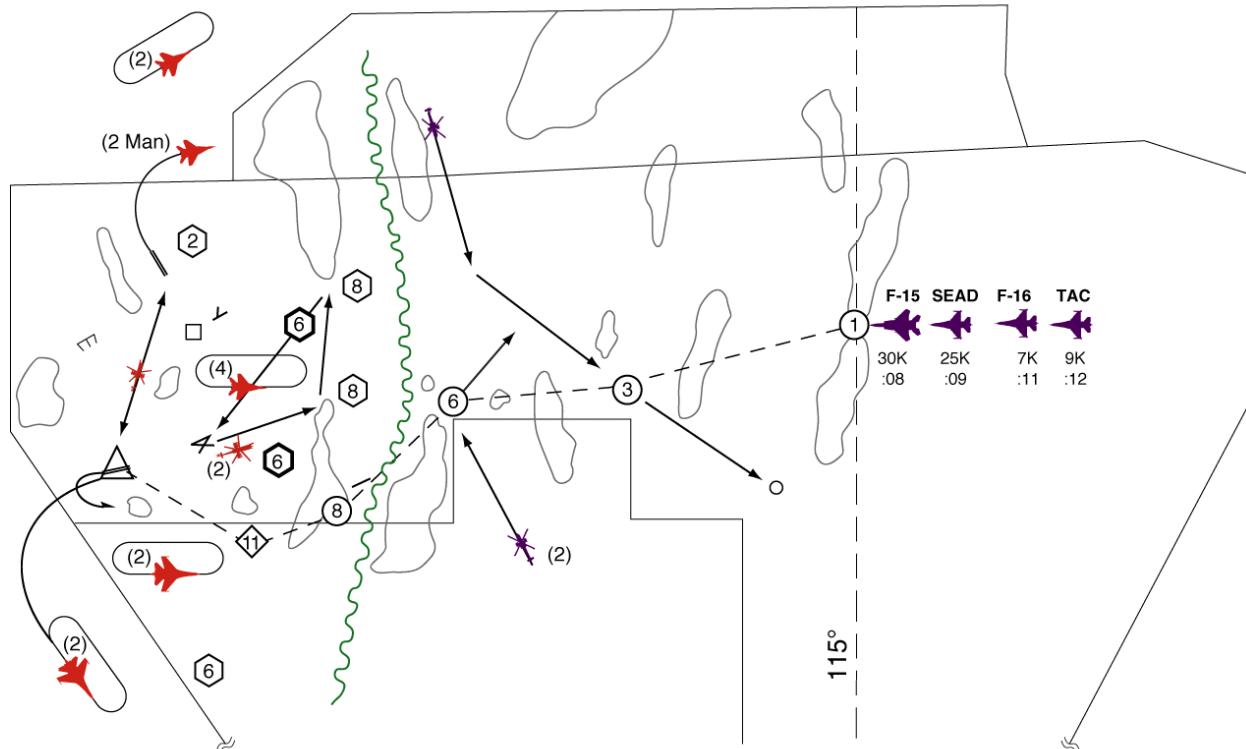


Daily Schedule

| Time (DC) TBA | Time (OK) Tinker | Time (NM) TACCSF | Time (AZ) AFRL | Team A 522 FS | Team B 185 FW | Team C 523 FS |
|------------------|---------------------|---------------------|-------------------|-------------------------|-------------------------|-------------------------|
| 1000-1030 | 0900-0930 | 0800-0830 | 0700-0730 | Brief Test Mission | | |
| 1030-1100 | 0930-1000 | 0830-0900 | 0730-0800 | Fly Test 1 | | |
| 1100-1130 | 1000-1100 | 0900-0930 | 0800-0830 | | Brief Test Mission | |
| 1130-1200 | 1030-1100 | 0930-1000 | 0830-0900 | | Fly Test 2 | |
| 1200-1230 | 1100-1130 | 1000-1030 | 0900-0930 | Debrief Test Mission | | Brief Test Mission |
| 1230-1300 | 1130-1200 | 1030-1100 | 0930-1000 | | | Fly Test 1 |
| 1300-1330 | 1200-1230 | 1100-1130 | 1000-1030 | Lunch break | Debrief Test Mission | |
| 1330-1400 | 1230-1300 | 1130-1200 | 1030-1100 | | | Brief Test Mission |
| 1400-1430 | 1300-1330 | 1200-1230 | 1100-1130 | Brief OCA A-G | | Fly Test 1 |
| 1430-1500 | 1330-1400 | 1230-1300 | 1130-1200 | | Lunch break | |
| 1500-1530 | 1400-1430 | 1300-1330 | 1200-1230 | Fly OCA A-G | | Debrief Test Mission |
| 1530-1600 | 1430-1500 | 1330-1400 | 1230-1300 | | Brief OCA A-G | |
| 1600-1630 | 1500-1530 | 1400-1430 | 1300-1330 | | | |



Surface Attack Tactics Mission (Test 1 & 2)



INITIAL PICTURE

2 x MiG-29 — North CAP
4 x MiG-29 — Center CAP
2 x Su-27 — South CAP
2 x Mi-24 — Target Area

SCENARIO INPUTS

:05 — 2 x MiG-29 (Man) takeoff Tonopah
:08 — 2 x AH-64 takeoff Box
:11 — Mi-24 takeoff Tonopah
:12 — 2 x MiG-29 (Center CAP) attack
:14 — AH-64 takeoff Bear Paw
:17 — 2 x MiG-29 (Center CAP) attack
:17 — 2 x Su-27 takeoff Tolicha
:20 — 2 x MiG-29 (Man) takeoff Tonopah

TARGETS

Tolicha Airfield

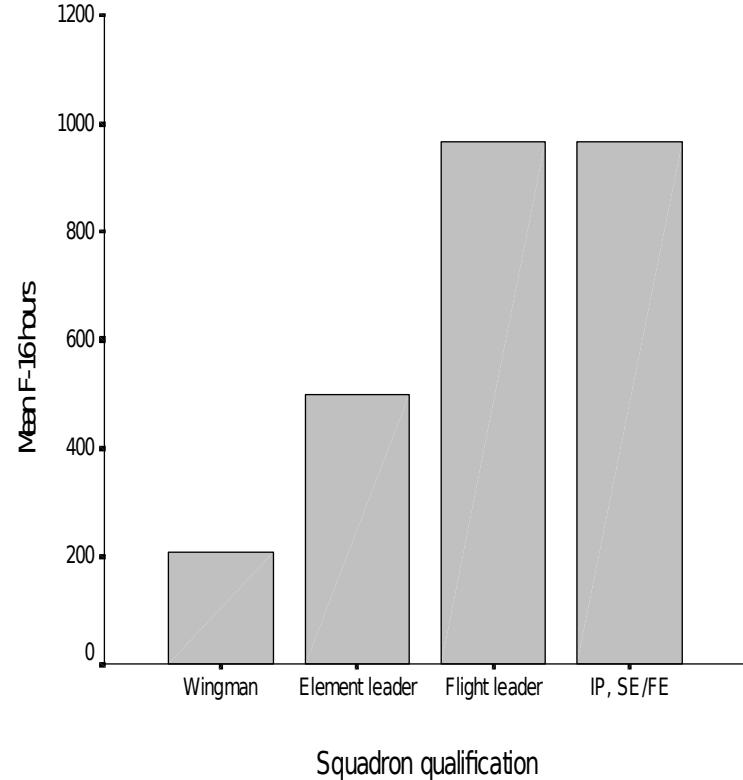
TOTs

F-16 :22
TAC :23:30



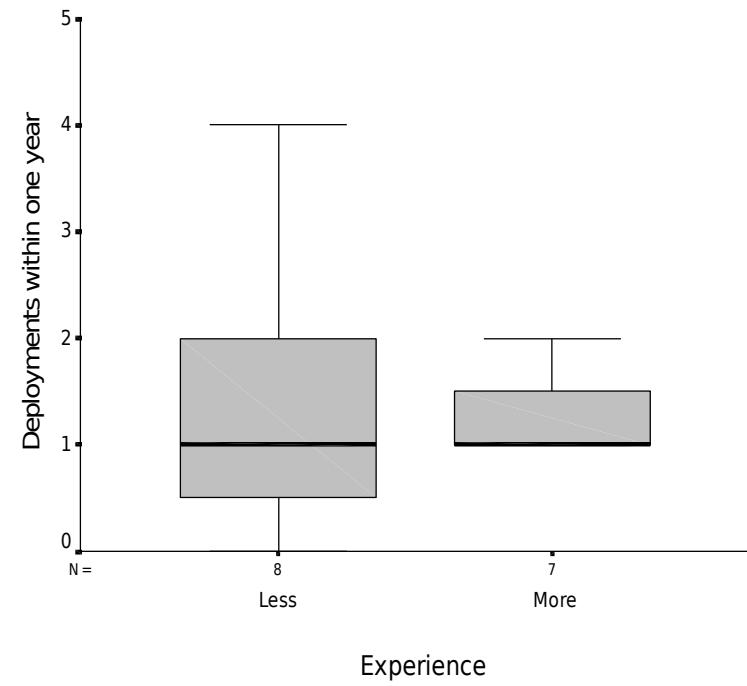
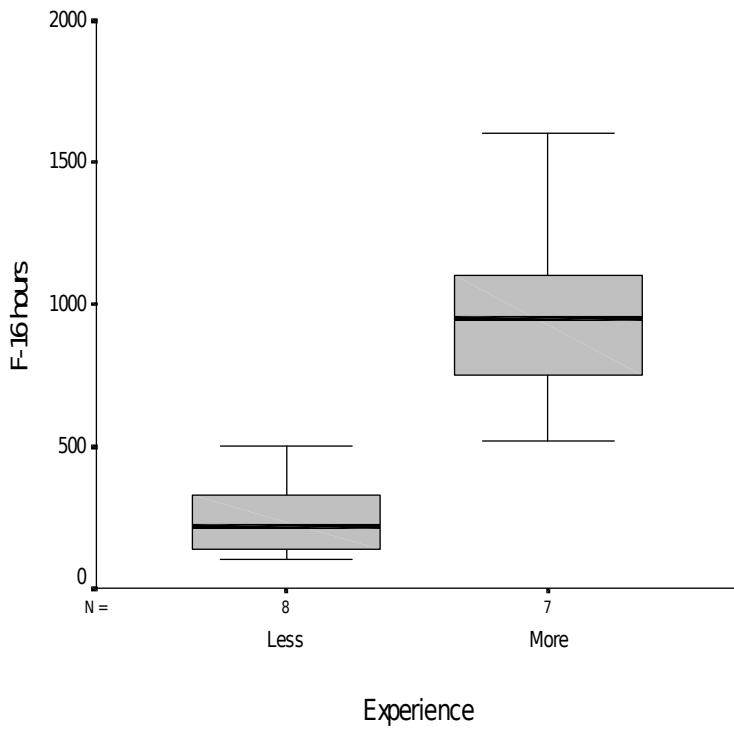
F-16 Pilots

- **Five pilots requested from each squadron:**
 - IP / SEFE
 - Mission commander
 - 4 or 2-ship flight lead
 - MR wingman
 - MR wingman





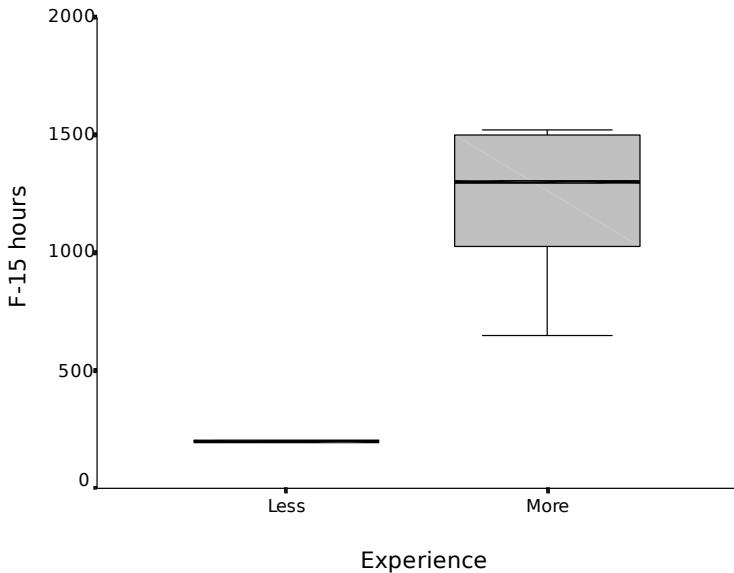
F-16 Pilot Experience



F-16 hours for more and Deployments for more and less experienced pilots



Other Roadrunner Participants



F-15 hours for more and less experienced pilots

- **Three AWACS teams**
 - **One WD served as lead with the other as support**
 - **WDs alternated lead and support roles**
- **Squadrons provided one more experienced WD and one less experienced--Team C:**
 - **500 flight hours**
 - **120 flight hours**



Exercise Summary

- **24 scheduled missions**
 - **No aborts, some delayed starts-- all missions completed on schedule**
 - **Communication problems with AWACS Mon and Tue**
 - **Corrected failures on F-16 cockpit: 2 missions**
 - **Hard failures on F-16 cockpit: 2 missions**

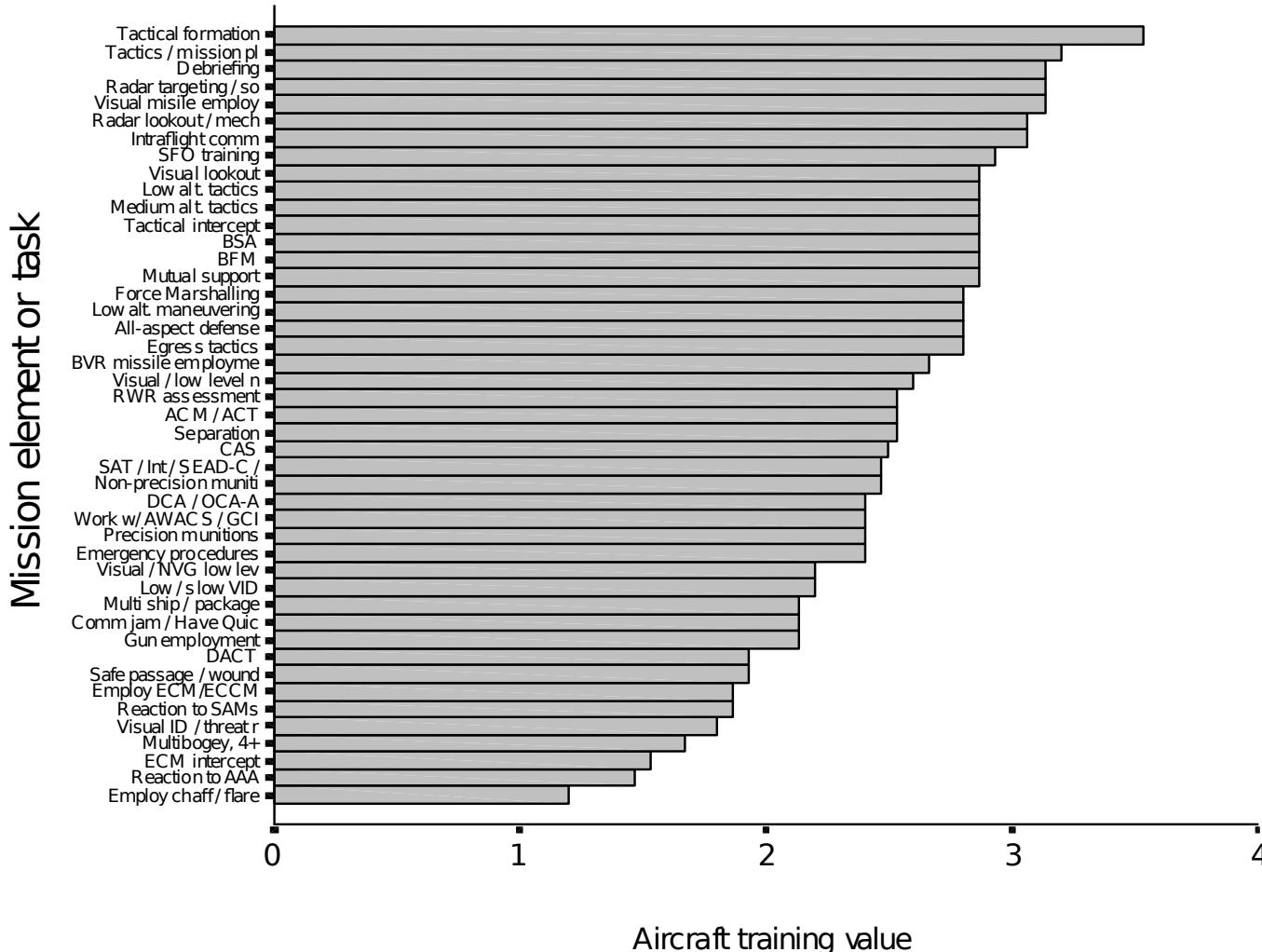


Questionnaire Data

- **Rating of aircraft training effectiveness for 45 mission tasks and elements--completed before familiarization ride**
 - **0 = Negative training for combat; aircraft training reduces combat readiness**
 - **4 = Total positive training; aircraft training is equivalent to combat experience**
- **Rating of DMT training--completed after last mission**
 - **0 = Negative training ; DMT training reduces combat readiness for this task**
 - **4 = Total positive training; DMT training is equivalent to combat experience**

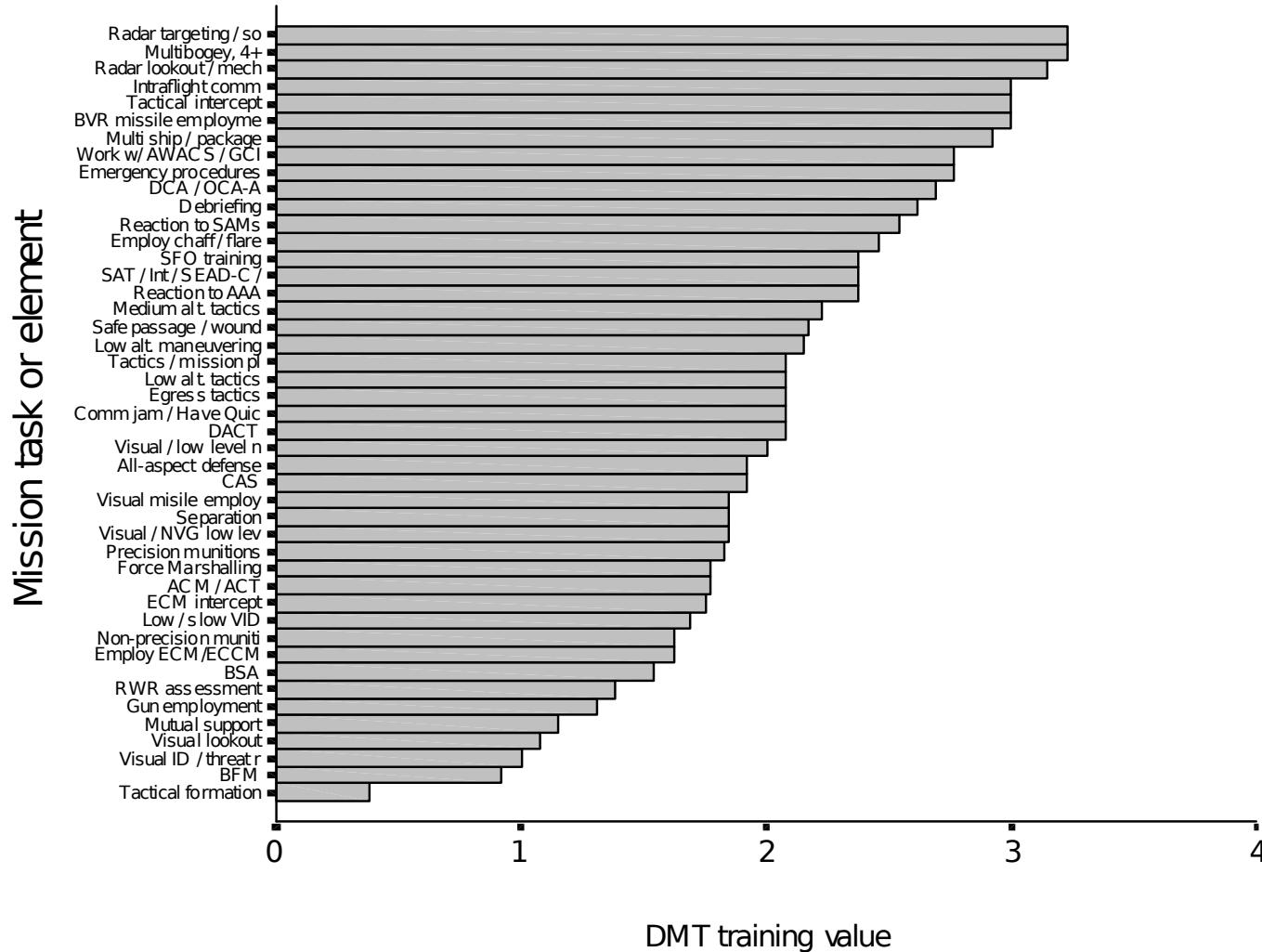


F-16 Pilot Ratings for Aircraft Training



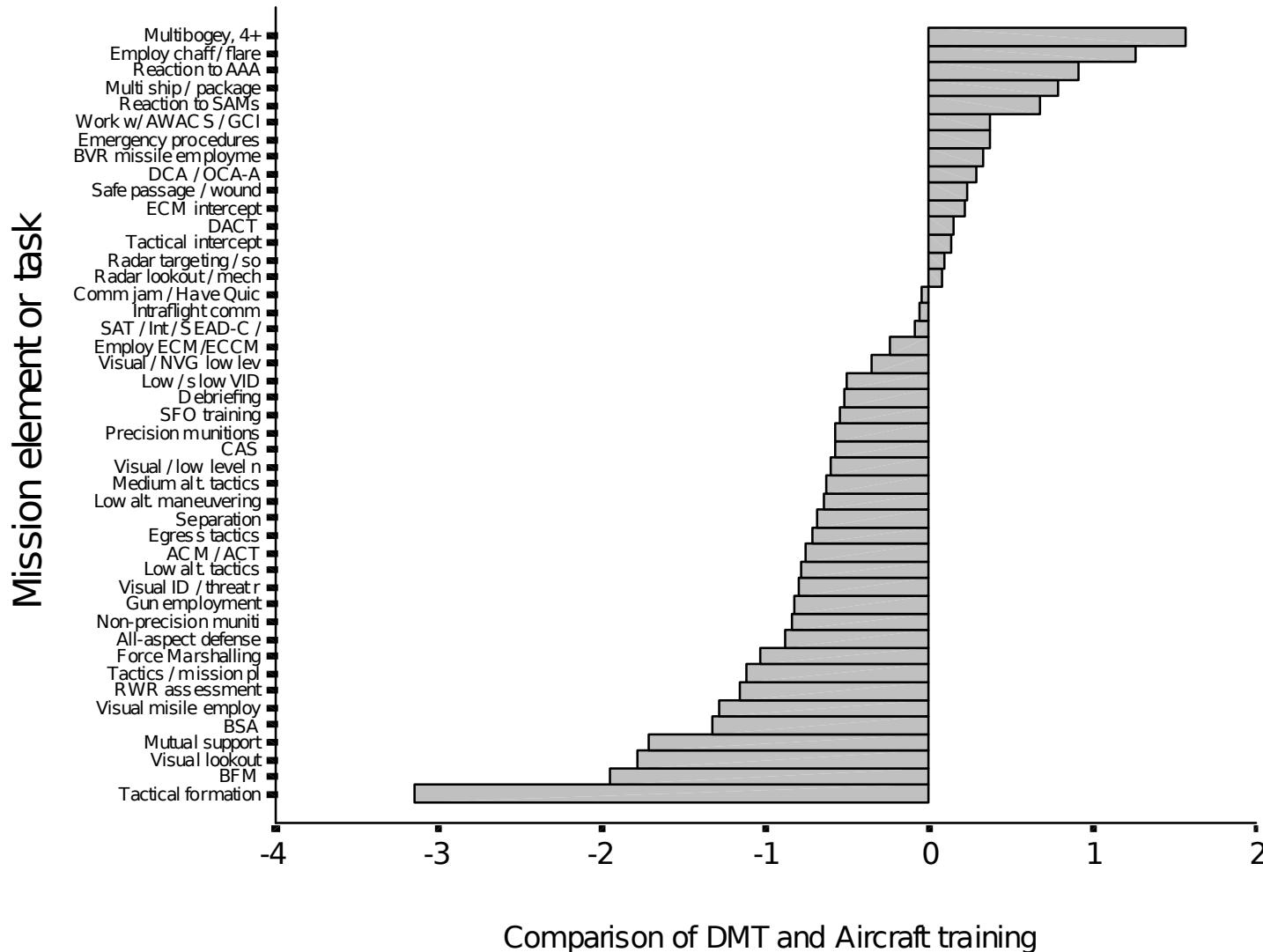


F-16 Pilot Ratings for DMT



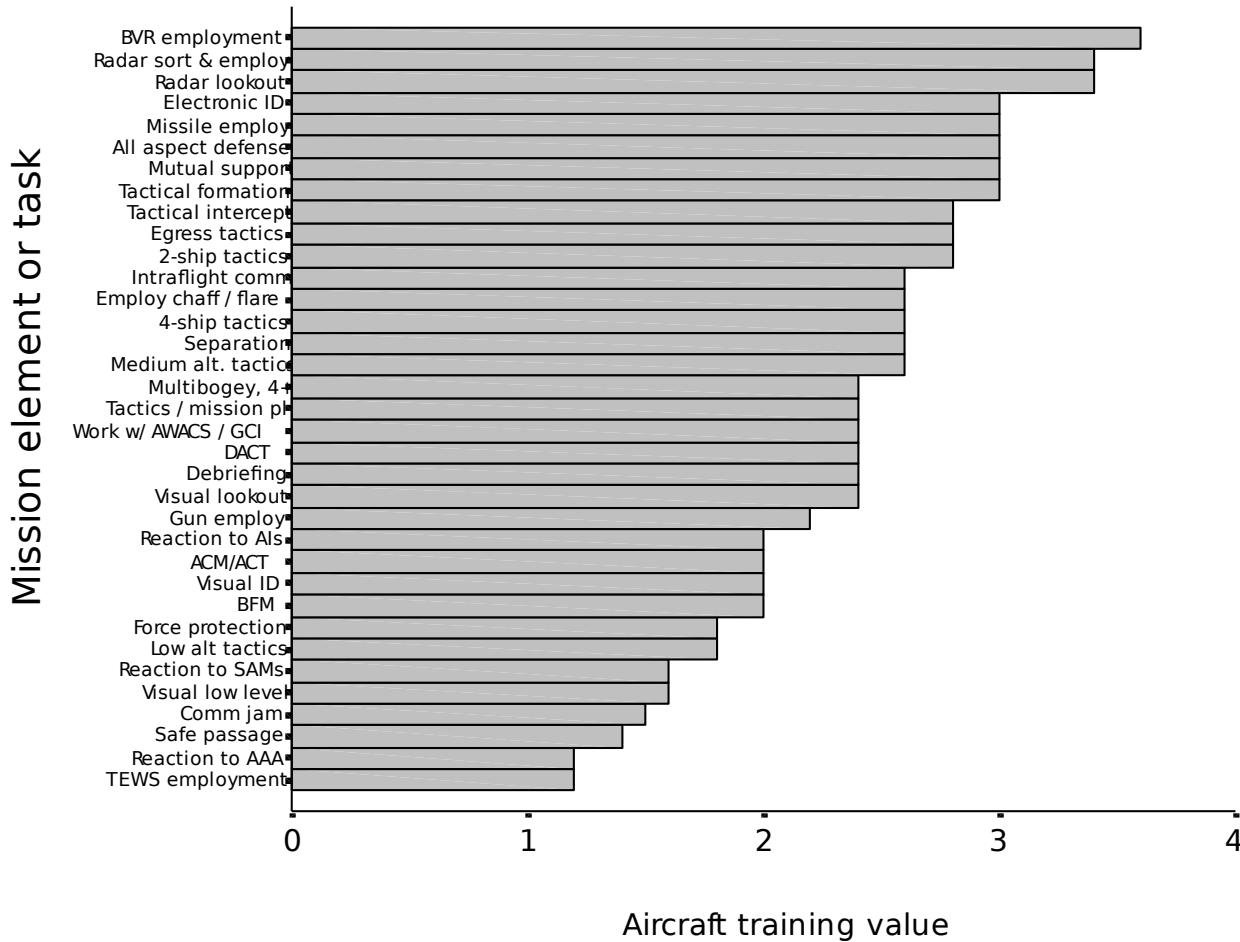


Comparison of F-16 Pilot Ratings for DMT and Aircraft Training



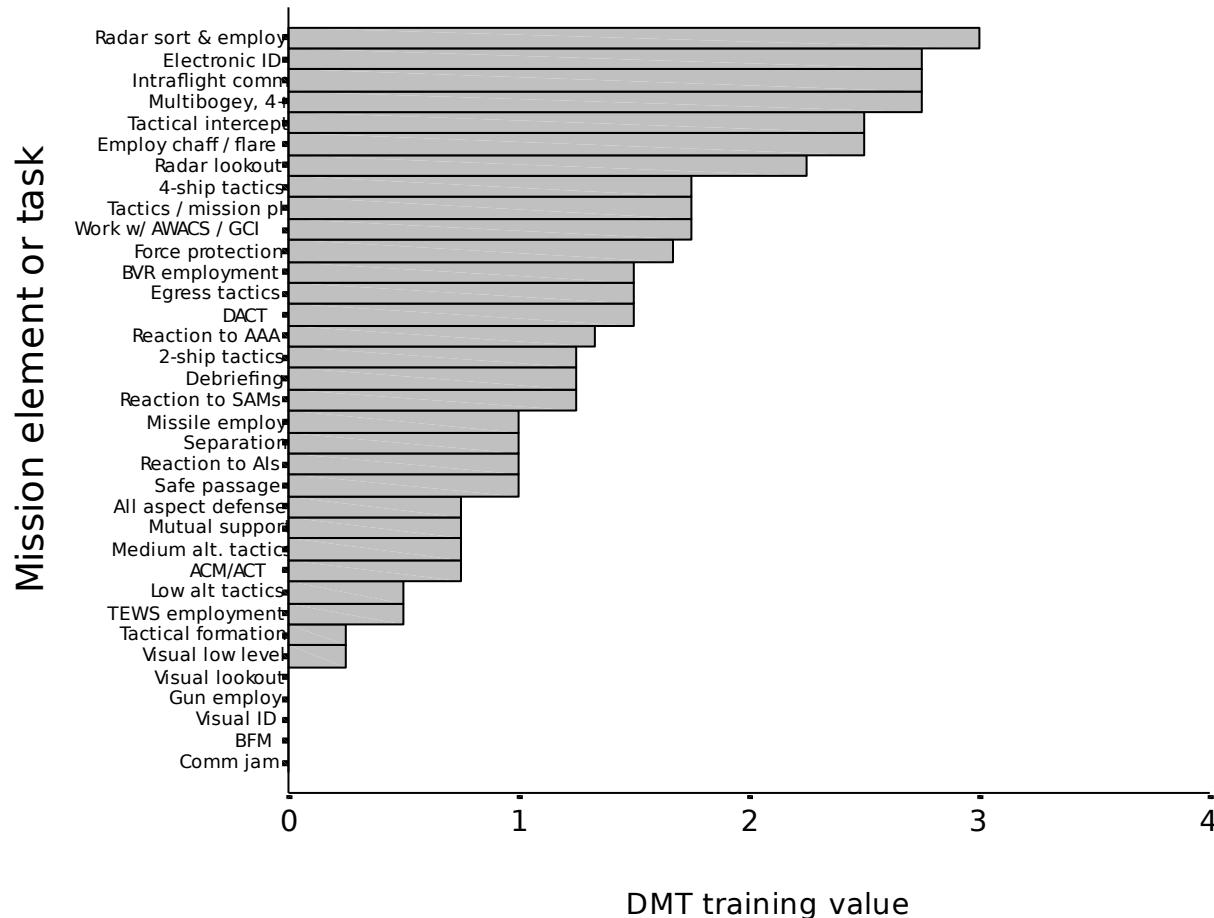


F-15 Pilot Ratings for Aircraft Training



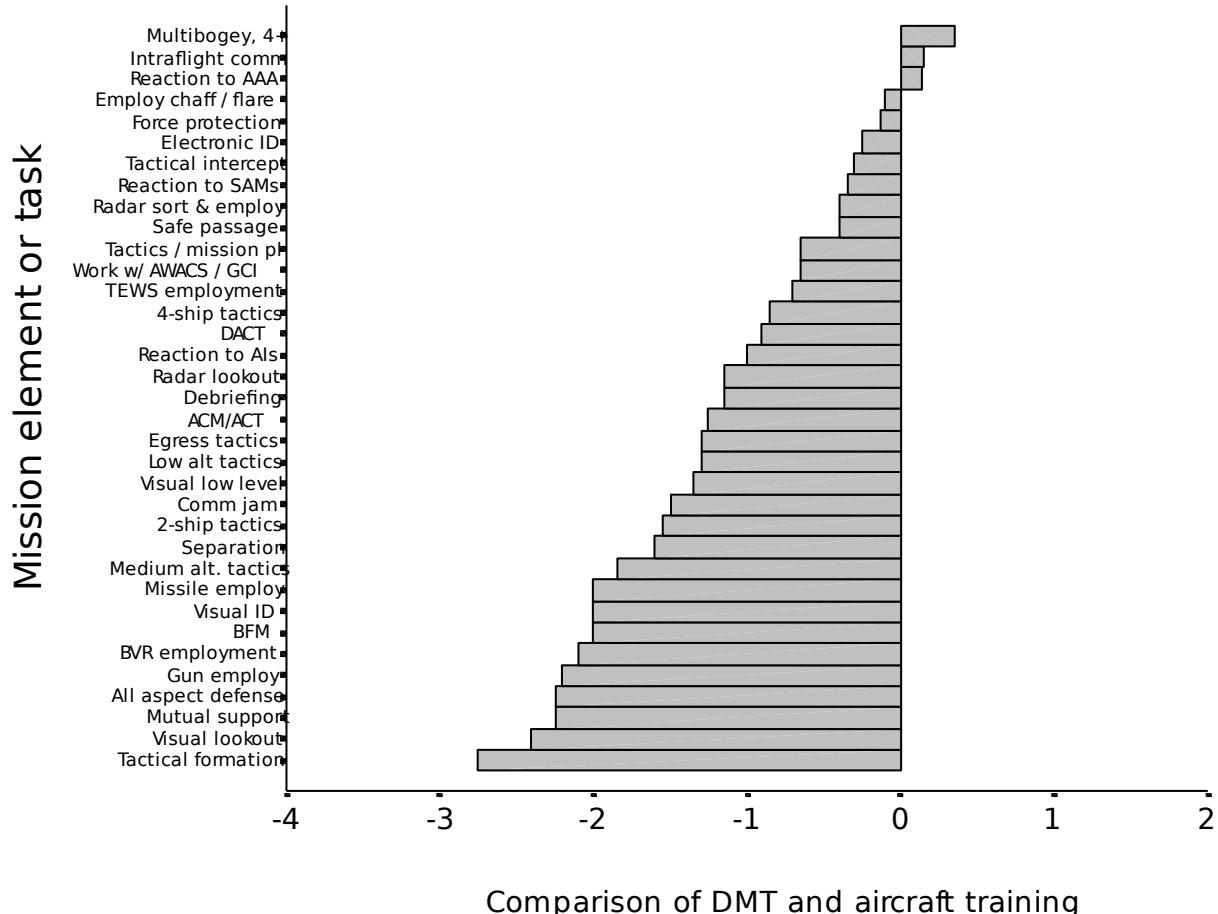


F-15 Pilot Ratings for DMT





Comparison of F-15 Pilot Ratings for DMT and Aircraft Training



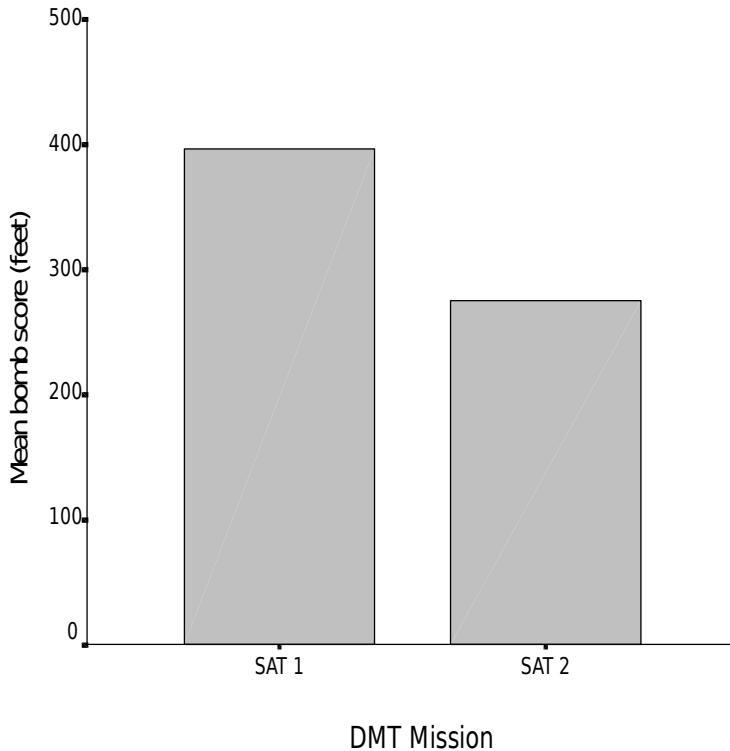


F-16 SAT 1 (Tue) vs. SAT 2 (Fri)

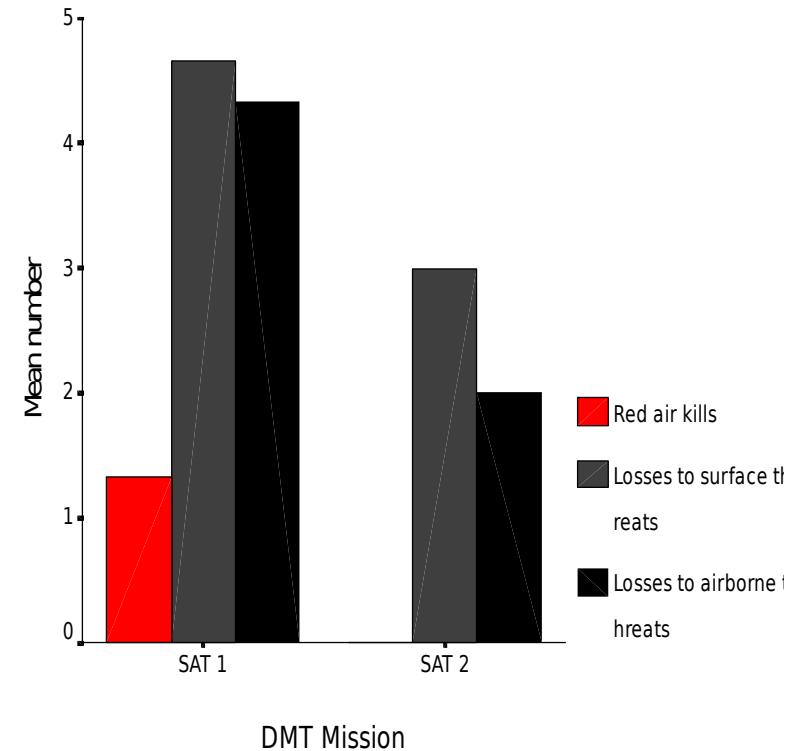
- **Bomb score / kills / losses**
- **Teamwork Observation Measurement Scales (TOMS) developed by NAWC-TSD**
 - Overall mission grade
 - Communication
 - Situation Awareness
 - Adaptability / Flexibility
 - Crew Coordination
- **Instructor pilot rating**
 - 1 = Unable to perform or dangerous
 - 3 = Nominal performance
 - 5 = Extraordinary performance



F-16 Bomb score / Kills / Losses



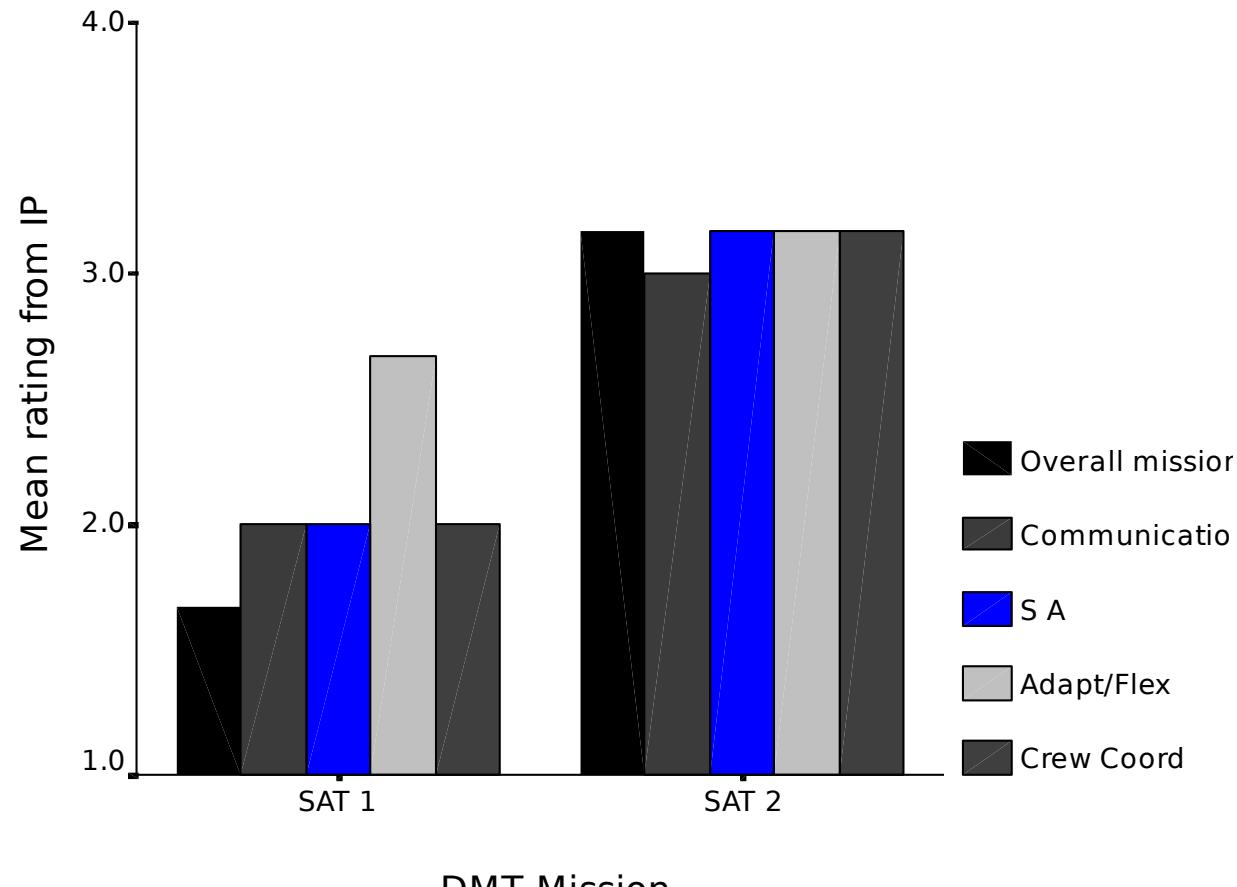
Bomb scores for test missions



Kills and losses for test missions



F-16 TOMS ratings from IP



Instructor ratings for test missions



Comments and Critiques

- **Technology problems**
 - **Communication with AWACS**
 - **Visual displays**
 - **Constructive forces**
- **Procedure problems**
 - **Time lines**
 - **Brief / debrief**
- **Best use of DMT**
 - **Intensive training--many rides in few days**
 - **Multi-ship, multi-bogey air-to-air with AWACS**
 - **Follow-up at Red Flag**



Comments and Critiques

“This is really going to save me lots of money. It is going to give me realistic training and decrease the time it is going to take me to experience a guy who is ready to go out on the road by himself.

It will make us a lot more efficient”

**Col Charles Winstead
Vice Commander
522 ACW, Tinker AFB**



Roadrunner Objectives

- **Document DMT technical capabilities necessary for combat mission training**
 - **System successes and shortfalls**
 - **Exercise development and management**
- **Validate research approach for DMT training effectiveness studies**
 - **Robust effects and sensitive measures**
 - **Relate performance to process**
 - **Develop and evaluate training strategies that take advantage of the unique capabilities of DMT**